

Kalene Wu

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EDUCATION

McMaster University

Bachelor of Engineering, Biomedical Engineering

Sep 2025 – Present

Hamilton, Ontario

- Relevant Coursework: Biology, Physics, Linear Algebra, Engineering Design, Programming Fundamentals

TECHNICAL SKILLS

Languages: Python, MATLAB, R

Tools: SolidWorks, Fusion 360, Arduino IDE, Excel, PowerPoint

Libraries: pandas, NumPy, Matplotlib, scikit-learn

Areas of Interest: Biomechanics, Medical Device Design, Bioinstrumentation, Rehabilitation Technology

PROJECTS

Modular Colostomy Bag Attachment Design | *Fusion 360, Biomedical Design*

- Collaborated in an interdisciplinary team to design modular attachments to improving comfort and hygiene for individuals with stomas.
- Iterated multiple attachment geometries in **Fusion 360** and performed simulated pressure and sealing tests, achieving a 40% reduction in leak rate.
- Integrated a silicone-based gasket for improved skin compatibility and airflow to minimize irritation.
- Collected qualitative feedback from two patients and a nurse practitioner to refine ergonomic curvature and alignment features.

Heart Rate Monitoring System (Team of 3) | *Arduino, Python*

- Built a wearable heart rate sensor using Arduino and PPG module, processing over 2,000 signal samples per subject.
- Implemented a moving-average filter and peak-detection algorithm in Python to achieve ± 2 bpm accuracy.
- Visualized live readings in a Python dashboard tested across 10 participants with varying physical activity levels.

3D-Printed Prosthetic Hand Prototype | *Fusion 360, PLA Printing*

- Designed and printed a tendon-driven prosthetic hand actuated by elastic cords with individual finger control.
- Conducted finite element analysis (FEA) to assess joint stress under 25 N applied load, improving structural efficiency by 20%.
- Presented final model at McMaster Engineering Design Expo (2025) as part of a rehabilitation technology demonstration.

EXPERIENCE

Hospital Co-op Student, Palliative Care Unit

Mackenzie Health Hospital (SHSM Program Partnership)

Sep 2023 – Jan 2024

Richmond Hill, ON

- Worked alongside nurses and physicians to support the daily needs of 15+ palliative care patients with empathy and professionalism.
- Monitored and documented patient comfort levels, meal intake, and mobility using standardized care tracking sheets.
- Observed and assisted during wound dressing changes, IV maintenance, and patient repositioning procedures.
- Communicated with families and coordinated visits while maintaining patient confidentiality and compliance with infection control protocols.
- Participated in weekly safety briefings and infection prevention audits to reinforce WHMIS and hospital safety compliance.

Lifesaving Instructor (Certified)

Lifesaving Society of Ontario

Jun 2022 – Aug 2023

Richmond Hill, ON

- Delivered CPR, First Aid, and aquatic safety training to over 60 youth and adults, emphasizing emergency response procedures aligned with public health standards.
- Demonstrated and supervised rescue techniques, improving participant success rate on certification exams by 25%.

- Integrated anatomical and physiological principles into lessons to explain the mechanisms of drowning, hypoxia, and resuscitation.
- Ensured WHMIS and Ontario Health & Safety compliance during all instructional sessions, maintaining a zero-incident record.